

Environmental Hazards: Earthquakes



National 5 Geography

What do the following Cities have in common?

Mexico City



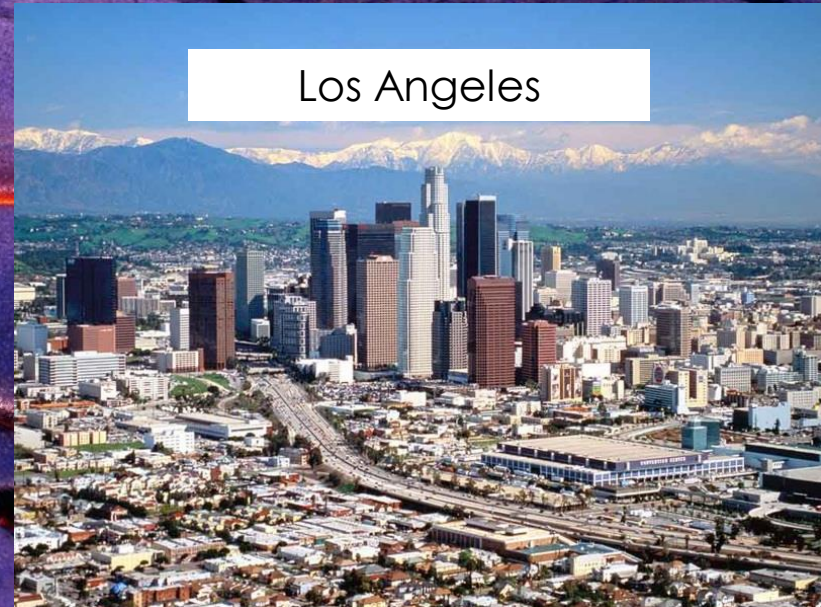
Tokyo



Santiago



Los Angeles



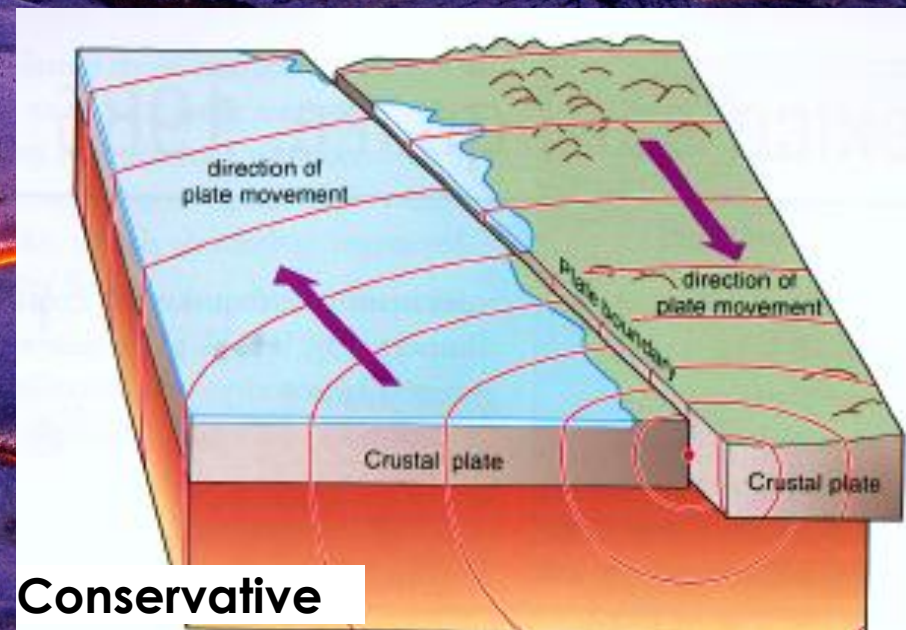
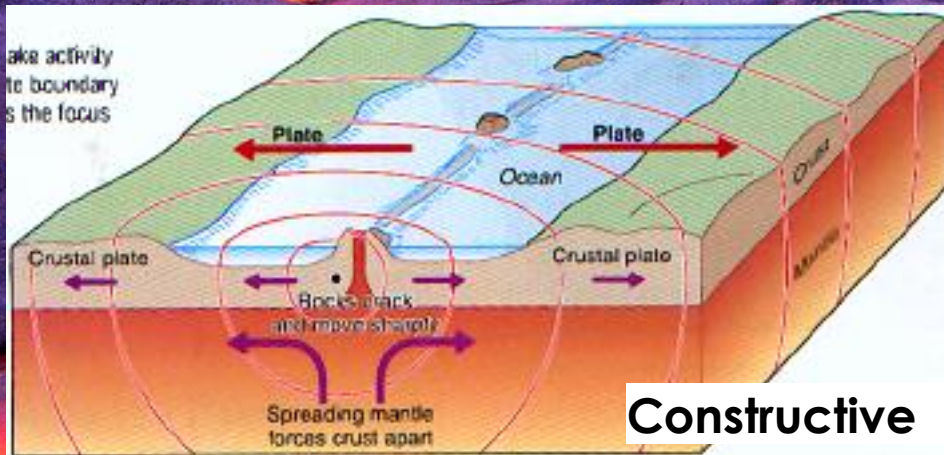
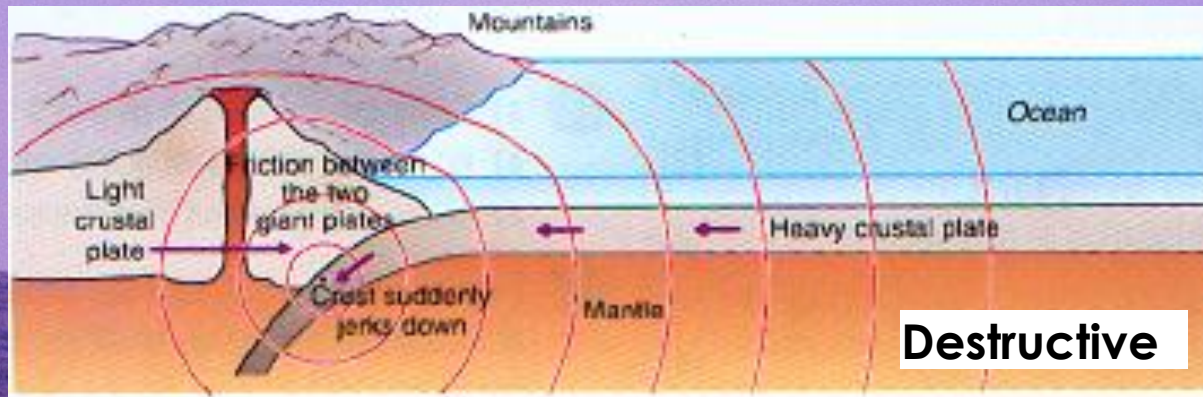
What do the following Cities have in common?

Answer: They are all at risk from major Earthquakes!

So what is an Earthquake?

An Earthquake is the sudden shaking of the earth caused by a sudden movement of rock beneath its surface. It is caused by the release of pressure as 2 tectonic plates move against each other.

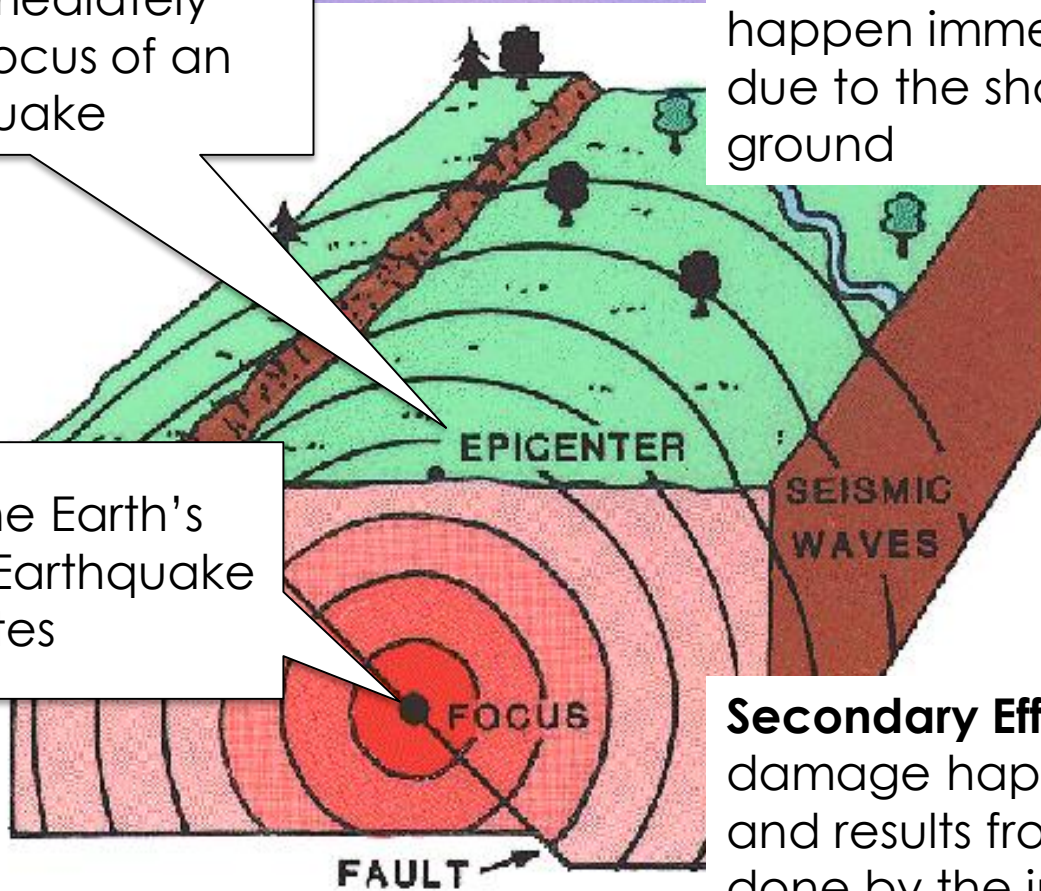
Earthquake Plate Boundaries



Model of an Earthquake: Key Terms

The point on the Earth's surface immediately above the focus of an Earthquake

Primary Effects: The damage caused by Earthquakes which happen immediately and is due to the shaking of the ground



The point in the Earth's crust where an Earthquake originates

Secondary Effects: This damage happens afterwards and results from the damage done by the initial tremor eg. Fires

Earthquakes

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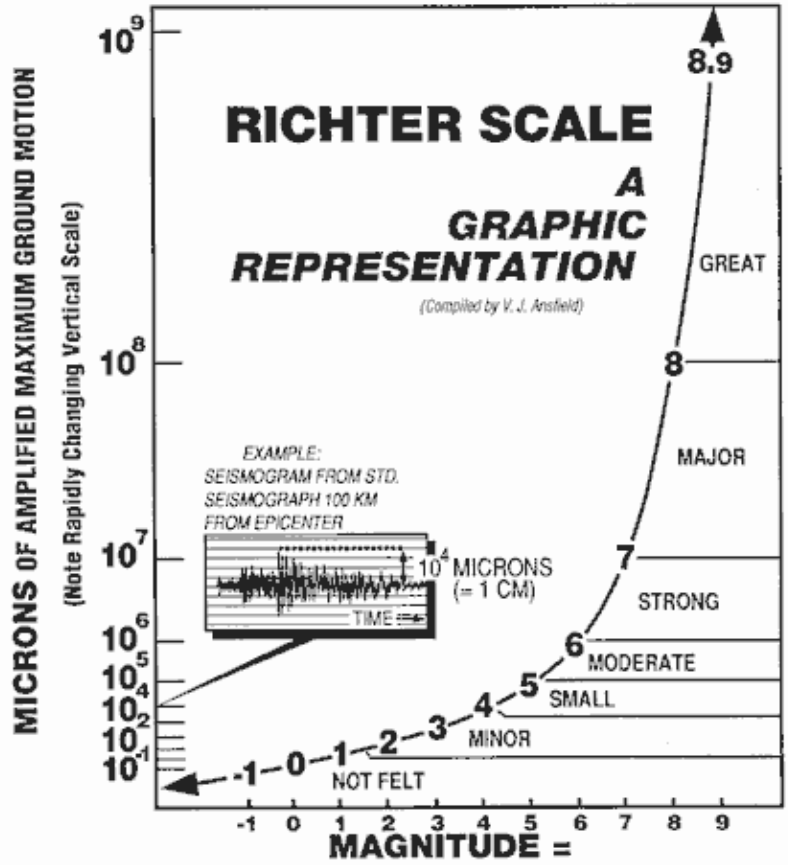


How do we Measure Earthquakes?



Seismometers measure the shaking of the ground, showing it as a line graph

How do we Measure Earthquakes?



Largest Recorded ***
(Offshore Chile, 1960)

Alaska, 1964
New Madrid, MO, 1812
San Francisco, 1906

Great Devastation
and Many
Fatalities Possible *

Damage Begins *
Fatalities Rare

Earthquakes are measured on the Richter Scale

The scale rates tremors on a scale of 1-10. 10 being the most powerful

Each number increase on the Richter Scale represents an increase of 10 times the energy of the previous number

* EFFECTS MAY VARY GREATLY DUE TO CONSTRUCTION PRACTICES, POPULATION DENSITY, SOIL DEPTH, FOCAL DEPTH, ETC.
** MICRON = A MILLIONTH OF A METER
*** EQUIVALENT TO A MOMENT MAGNITUDE OF 9.5

The Effects of an Earthquake

The strength of an Earthquake depends on certain things:

The force of the Earthquake

The depth of the Earthquake

The distance from the nearest settlement

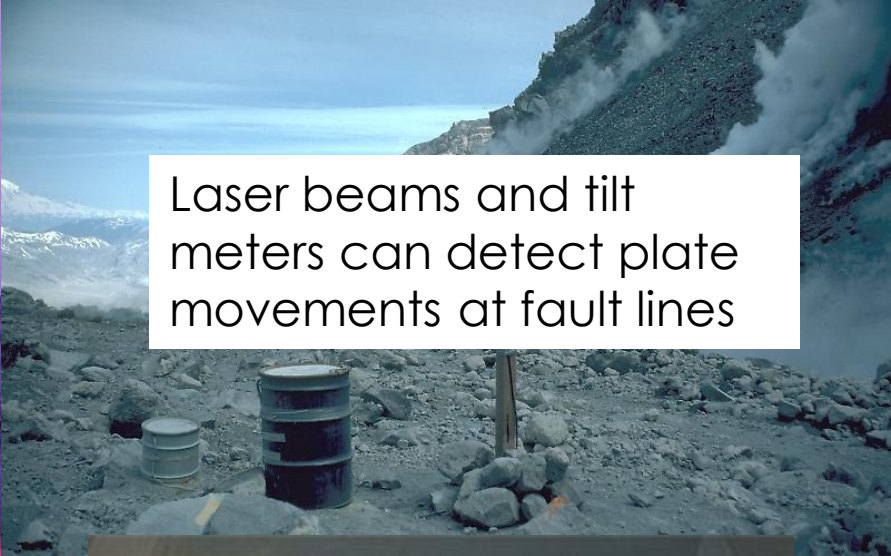
Soil type and the amount of water in the ground

The quality of the buildings and the preparations made by the population

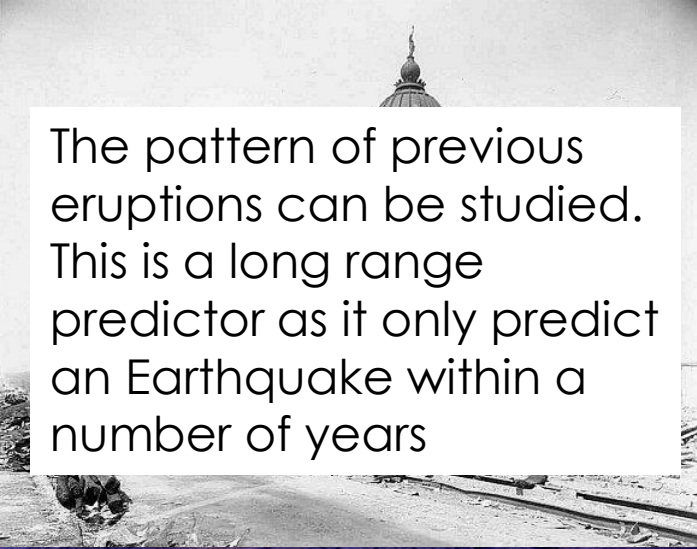
The time of day the quake occurs




Predicting an Earthquake



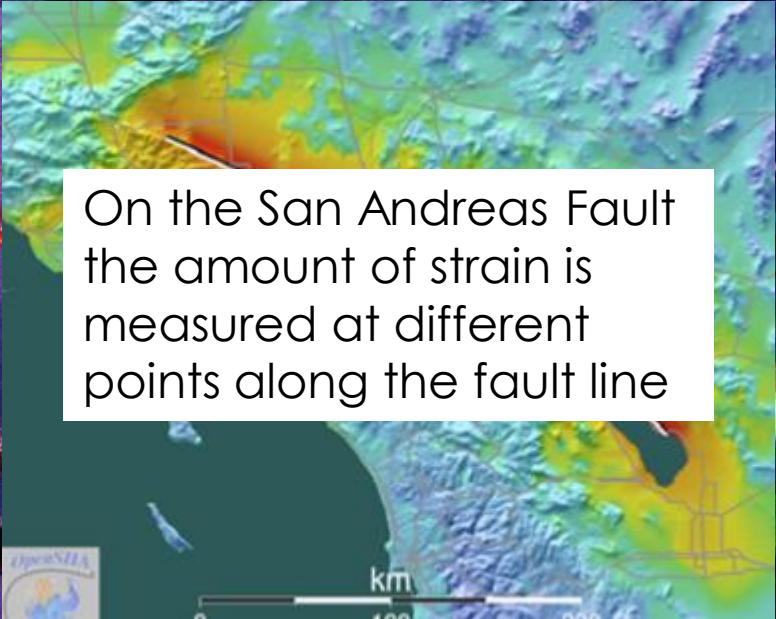
Laser beams and tilt meters can detect plate movements at fault lines



The pattern of previous eruptions can be studied. This is a long range predictor as it only predicts an Earthquake within a number of years




Seismometers can pick up vibrations in the Earth's crust. Although they only give a few seconds warning




On the San Andreas Fault the amount of strain is measured at different points along the fault line

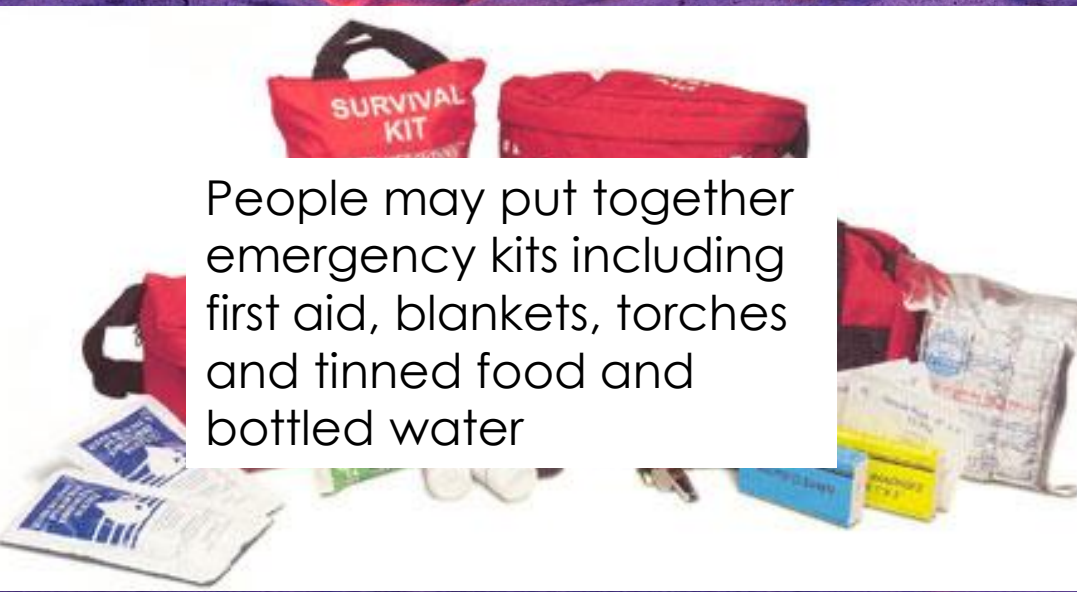
How can people prepare for an Earthquake?

A woman in a blue shirt and jeans is walking on a green mat in a hallway during an earthquake drill. A whiteboard with photos is visible on the left.

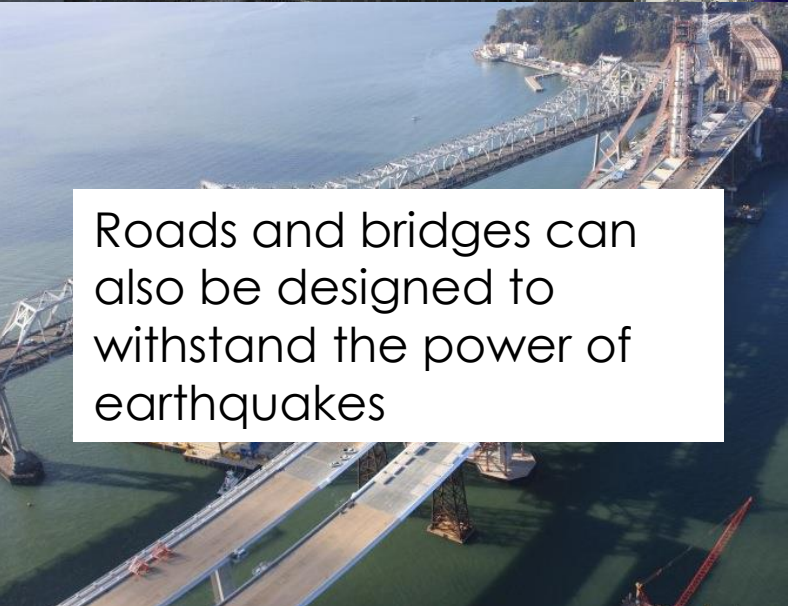
Earthquake drills as well as TV/Radio/Internet videos educate people on what they should do in the event of an Earthquake

An aerial view of San Francisco, California, showing the Transamerica Pyramid and other skyscrapers in the city skyline.

Earthquake proof buildings are designed to absorb the energy of an earthquake and remain standing

A collection of emergency supplies including a red survival kit bag, blankets, bottled water, and other supplies.

People may put together emergency kits including first aid, blankets, torches and tinned food and bottled water

An aerial view of a suspension bridge, likely the Golden Gate Bridge, spanning across a body of water.

Roads and bridges can also be designed to withstand the power of earthquakes

Earthquakes and Aid

From our Mount Saint Helens Case Study we know the following:

Short Term Aid involves rapid response to a disaster, including rescuing people, providing emergency health care, food and water and clearing up after the event

Long Term Aid is concerned with returning an area back to its original state through rebuilding

TASK: Using the definition above sort the following into long term and short term aid by creating a table in your notes.

New Hospitals
and Schools

Bottles of Water

Counselling

Emergency
Health Kits

Doctors and
Nurses

Financial
Assistance

Body Heat
Sensors

Bulldozers

Cancellation of
Debt

Tents and
Blankets

Toilet
Portacabins

Building
Materials

Food Parcels

Education

Clothing